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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Kenneth G. Blemel

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EXAMINER

WEST, JEFFREY R

ART UNIT

PAPER NUMBER

2857

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/966,397

Applicant(s)

BLEMEL, KENNETH G.

Examiner

Jeffrey R. West

Art Unit

2857

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/23/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. Item #5 on the Information Disclosure Statement filed December 23, 2003, has not been considered because a copy of the reference has not been supplied.

Supplied, along with references 1-4 on the disclosure statement, is a paper by Roy McMahon et al. entitled "Organized Wiring: 21st Century Aircraft Infrastructure Backbone (in 20th Century Aircraft)".

Drawings

2. The drawings in Figures 3-6 are objected to because they do not have sufficiently descriptive labels. Blank boxes in drawings should be labeled descriptively unless it is a well-known component.

3. The drawings are objected to because of the following informalities:

Page 15, lines 6-7 indicates that the "insulated core element" is labeled "1" and the "insulation" is labeled "2". Figure 2B, however, appears to label the core element "2" and the insulation "1".

4. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The

figure or figure number of an amended drawing should not be labeled as "amended."

If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action.

5. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

6. The disclosure is objected to because of the following informalities:

On page 8, line 12, "f.ashion" should be ---fashion---.

Page 16, lines 8-9, label the "tape supporting sensitized media" as "17" and the "supporting surface" as "18". This description is not in accordance with Figure 2B which labels the supporting surface as "17" and does not label the tape. Applicant is also directed to page 20, line 32, that labels the "surface" as "17".

Page 22, line 10, labels the conduit as "7" when the reference number "7" has been defined for "interconnections".

On page 24, line 12, "incision.." should be ---incision.---.

Appropriate correction is required.

Claim Objections

7. Claims objected to because of the following informalities:

In claim 2, line 1, "An monitoring device" should be ---A monitoring device---.

In claim 2, line 2, "the device" should be ---the monitoring device---.

In claim 2, line 4, "the sensor information" should be ---sensor information---.

In claim 2, line 9, to avoid problems of antecedent basis, "the programmed processor" should be ---the at least one programmed microcontroller or other processor---.

In claim 2, line 19, to avoid problems of antecedent basis, "the programmed processor for operating the processor" should be ---the at least one programmed microcontroller or other processor for operating the at least one programmed microcontroller or other processor---.

In claim 2, line 22, to avoid problems of antecedent basis, "the programmed processor" should be ---the at least one programmed microcontroller or other processor---.

In claim 2, line 23, to avoid problems of antecedent basis, "the program" should be ---the at least one programmed microcontroller or other processor---.

In claim 2, line 24, to avoid problems of antecedent basis, "the programmed processor" should be ---the at least one programmed microcontroller or other processor---.

In claim 2, line 25, to avoid problems of antecedent basis, "baseline operating parameters" should be ---baseline operational parameters---.

In claim 3, line 1, to avoid problems of antecedent basis, "the sensor set" should be ---the set of sensors---.

In claim 4, line 1, to avoid problems of antecedent basis, "the sensor set" should be ---the set of sensors---.

In claim 25, line 1, to avoid problems of antecedent basis, "the outer surface" should be ---an outer surface---.

In claim 42, line 1, to avoid problems of antecedent basis, "the heath status" should be ---a health status---.

In claim 42, line 9, "the form and fit of the monitoring device" should be ---a form and fit of a monitoring device---,

In claim 42, line 11, "the monitoring apparatus" should be ---the monitoring device---.

In claim 42, line 12, "said conduit" should be ---a conduit---.

In claim 42, line 14, "an a solid object" should be ---a solid object---.

In claim 42, line 15, "said medium" should be ---said sensitized medium---.

In claim 42, line 17, "when and where" should be ---when, where---.

In claim 42, line 20, "said apparatus" should be ---said monitoring apparatus---.

In claim 42, line 36, "said medium" should be ---said sensitized medium---.

In claim 42, line 37, it is assumed that "the characteristics" refers to the "characteristic parameters" and therefore, "the characteristics" should be changed to ---the characteristic parameters---.

In claim 42, line 39, "said test sequence" should be ---said first test sequence---.

In claim 42, line 49, "the processor" should be ---the digital processor---.

In claim 42, line 50, "information:" should be ---information to:---.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claims 1-41 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 1 is rejected as being not sufficiently enabled by the specification because it recites, "a centralized data processor coupled to the plurality of local monitoring devices . . . for generating a set of weighting parameters for each local conduit monitoring device, and for communicating the set of weighting parameters to each

local conduit monitoring device.” The specification, however, does not provide any description of weighting parameters. Further, the specification does not support the generation of weighting parameters at a centralized data processor for communication to local monitoring devices. Because of this lack of disclosure, it is unclear to one having ordinary skill in the art as to what weighting parameters are generated, how they are generated, and how they are used, and therefore it is unclear to one having ordinary skill in the art how to make/use the invention.

Claim 2 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement because it recites, “conditioning and normalizing the sensor information based on parameters and environmental condition of the conduit” and “processing the normalized information to provide an output signal indicative of the diagnostic condition and the prognostic estimate of remaining useful life”. The specification, however, does not describe this aspect of the invention and therefore one having ordinary skill in the art would not understand how the sensor information is normalized and with respect to what the information is normalized.

Claims 4-16 are rejected as lacking enablement because they include limitations specifying in the baseline operational parameters “variances” and a “range”. The specification, however, does not include any disclosure for calculating/determining such values. Further, since these values are not supported in the specification it is also unclear as to what values they represent, such as whether the “variances” are the well-known defined statistical variances or variances between the values as well as whether the range refers to the operating range, range of values, etc.

Claims 37 and 41 are rejected as not being sufficiently enabled by the specification because they include limitations for specifying that "the material" is comprised of "ceramic" and "a concretion". These limitations, however, are not described in the specification and therefore one having ordinary skill in the art would not be enabled to use the particular aspects in carrying out the invention.

Claims 3, 17-36 and 38-40 are rejected under 35 U.S.C. 112, first paragraph, because they incorporate the lack of enablement in parent claim 2.

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claims 1-42 are rejected as failing to define the invention in the manner required by 35 U.S.C. 112, second paragraph, by being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claim(s) are narrative in form and replete with indefinite and functional or operational language. The structure which goes to make up the device must be clearly and positively specified. The structure must be organized and correlated in such a manner as to present a complete operative device. The claim(s) must be in one sentence form only. Note the format of the claims in the patent(s) cited.

Claim 1, lines 4-6, recite "each local monitoring device having: a centralized data processor . . ." This limitation is considered to be vague and indefinite because it is

unclear to one having ordinary skill in the art how a local monitoring device can have a central data processor. It is suggested that in lines 4-5 Applicant delete "each local monitoring device having".

Claim 2, line 7, is considered to be vague and indefinite because it recites "the prognostic estimate" without a previous mention of any prognostic estimate. Therefore, it is unclear to one having ordinary skill in the art to what "the prognostic estimate" refers.

In claim 2, line 15, it is unclear whether "and an indicating substance with the purpose to provide sensor information" is part of the list of groups of mediums or is one of the items being supported/conducted by the medium.

In claim 2, line 21, the recitation, "stored in as baseline" is unclear because it is unclear as to where "in" refers.

Claim 3, line 2 recites "such as but not limited to" this recitation does not receive any patentable weight because it is not an actual limitation. Since this recitation does not provide any limitation, it is suggested that "such as but not limited to, florescent debris or a fluorescent dye" be deleted.

Claim 2 specifies that the outputs of the sensors are processed and stored as baseline operational parameters. Therefore, since the operational parameters are signals/values it is unclear how these operational parameters can include a sensor "means". For this reason, claims 4-16 are rejected under 35 U.S.C. 112, second paragraph, as being vague and indefinite.

Claims 17 and 18 are rejected as being vague and indefinite because they further limit "The apparatus of claim 2". Claim 2 is a "monitoring device" that includes a plurality of apparatuses including sensors and microcontrollers. Therefore, it is unclear to which apparatus "The apparatus" further limits.

Claim 19-32 are rejected under 35 U.S.C. 112, second paragraph, because they are written as "The sensitized media of claim 2" while claim 2 is a "monitoring device". In order to put these claims in correct form, "The sensitized media of claim 2" should be something similar to ---The monitoring device of claim 2 wherein the sensitized media . . . ---. A similar correction should be made to claims 33-41 with respect to the recitation of "The conduit of claim 2".

Claim 19, line 2 is considered to be vague and indefinite because it includes a limitation for "the branches" without a previous mention of any "branches". Therefore it is unclear to one having ordinary skill in the art as to what "the branches" refers.

Claim 19, line 4 is considered to be vague and indefinite because it recites "but not limited to". This recitation does not receive any patentable weight because it is not an actual limitation. Since this recitation does not provide a limitation, it is suggested that "but not limited to" be deleted or changed to ---at least one of---.

Claim 20 is rejected under 35 U.S.C. 112, second paragraph, because of multiple dependency since it depends on both claims 2 and 3.

Claim 20 is considered to be vague and indefinite because it recites "the signal generators", "the signal detectors" and "the insulation material" without a previous

mention of any "signal generators", "signal detectors", or "insulation material".

Therefore it is unclear to one having ordinary skill in the art as to what "the signal generators", "the signal detectors" and "the insulation material" refer.

Claim 22, line 1 is considered to be vague and indefinite because it includes a limitation for "the insulation material" without a previous mention of any "insulation material". Therefore it is unclear to one having ordinary skill in the art as to what "the insulation material" refers.

Claim 23, line 1 is considered to be vague and indefinite because it includes a limitation for "the insulated cores" without a previous mention of any "insulated cores". Therefore it is unclear to one having ordinary skill in the art as to what "the insulation cores" refers.

Claim 24, line 1 is considered to be vague and indefinite because it includes a limitation for "the insulation" without a previous mention of any "insulation". Therefore it is unclear to one having ordinary skill in the art as to what "the insulation" refers.

Claim 25, line 1 is considered to be vague and indefinite because it includes a limitation for "the insulation" without a previous mention of any "insulation". Therefore it is unclear to one having ordinary skill in the art as to what "the insulation" refers.

Claim 36-41 are considered to be vague and indefinite because they further limit "the material" to a particular type while parent claim 2 does not contain any limitation

for a "material". Therefore it is unclear to one having ordinary skill in the art as to what "the material" refers.

Several lines of claim 42 are considered to be vague and indefinite for lacking antecedent basis. These sections include "the requirements" (line 3), "the system" (line 3), "the functions" (line 4), "the distributed computers" (line 4), "the parameters" (line 6), "the components" (line 7), "the readings" (line 26), "the remaining useful life" (line 30), "the information" (line 32), "the position" (line 55), and "the response" (line 57).

In claim 42, lines 20, 35, 39, and 49 are bulleted by roman numerals. It is unclear, however, what these bullets are differentiating between since the steps included within each numeral do not seem to share any characteristics.

Claim 42 is considered to be vague and indefinite because line 19 recites "comprising the steps of" but it is unclear to what the steps refer. It is assumed that these steps refer back to the determination step and therefore "comprising" should be ---the determining comprising---

Claim 42 is also considered to be vague and indefinite because line 46 contains limitations for "said step of measuring and said step of determining". Since claim 42 previously mentions several steps of measuring and determining, it is unclear to one having ordinary skill in the art as to what steps this limitation refers.

Claim 42 is considered to be vague and indefinite because line 54 includes a limitation for "the information" but since claim 42 mentions several types of information, it is unclear to what "the information" refers.

Further regarding claim 42, the phrase "i.e." (line 45) and "such as" (lines 14 and 57) render the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 2, 4, 7-9, 11, 13, 14, 17-19, 21-26, 31, 32, 35, and 38, as may best be understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,512,444 to Morris, Jr. et al. in view of U.S. Patent No. 5,245,293 to Runner.

Morris discloses a monitoring device for use in monitoring at least one conduit with at least one conductor for diagnostic purposes (column 4, lines 50-58), the device comprising at least one programmed microcontroller or other processor (column 3, lines 19-22) for the purpose of acquiring sensor information from a set of sensors and sensitized medium (column 5, lines 59-64), conditioning and normalizing the sensor information based on parameters and environmental condition of the conduit (column 10, lines 5-15), and for processing the normalized information to provide an output signal indicative of the diagnostic condition of the conduit and conductors it monitors (column 7, lines 30-33 and 51-53).

Morris discloses a set of sensors having outputs coupled to the at least one programmed processor, at least one sensor being an environmental sensor for providing environmental information indicative of the local environmental condition (column 9, lines 13-16) and sensors that are strips or strands of heterogeneous sensitized medium said medium capable of supporting or conducting an electrical current and voltage (column 8, lines 44-60) with each sensor or strand of sensitized medium being positioned with respect to the conduit to provide information concerning the environment and damage and deterioration to the conduit (column 3, lines 1-5).

Morris discloses means operatively associated with the programmed processor for operating the processor in a birth certificate mode wherein the outputs of the sensors are processed by the programmed processor and stored as baseline operational parameters (column 8, lines 44-60) and means associated with the programmed processor for operating the device in a monitoring mode, after the program has operating in the birth certificate mode, wherein the programmed processor acquires, conditions, and processes the outputs from the sensors, compares the processed outputs to the baseline operating parameters, and provides an indication of the diagnostic condition of the conduit based on the comparisons (column 8, line 61 to column 9, line 12).

Morris discloses the sensor set and baseline operational parameters including temperature data (column 9, lines 16-23) and the strand of sensitized medium being temperature sensitized (column 3, lines 1-5), corrosive sensitized (column 1, lines

21-23), chafing/abrasion sensitized (column 6, lines 43-46), chemically sensitized (column 10, lines 44-46), man-made material filled, or noble or base metal coated (column 5, lines 5-11).

Morris discloses a communication link for communicating data from the programmed processor to a visual display of the diagnostic condition of the conduit (column 9, lines 5-12 and column 7, lines 51-53).

Morris discloses connection of the strips in sections and further attaches to the apparatus for connection to alternating current electricity (column 5, lines 41-45 and column 10, lines 16-56) and including a mixture of dielectrics in the sensitized media insulation (column 5, lines 11-13).

Morris discloses that the sensitized media is in a helical format on an inner layer of the insulation (column 3, lines 1-2) or on the outer surface of the insulation (column 7, lines 11-12).

Morris discloses that the sensitized media act as transmission lines for transmitting conducted electricity (column 8, lines 44-60).

Morris discloses connecting/coupling the sensitized media to form a plurality of sections (column 5, lines 41-45).

As noted above, the invention of Morris teaches many of the features of the claimed invention and while the invention of Morris does teach determining the rate of degradation of the sensed media (column 10, lines 1-4), Morris does not specifically include determining the degree of degradation by determining the remaining useful life of the conduit.

Runner teaches an adhesive bond degradation monitor including means for determining when a measured property meets a threshold and using rate of degradation to estimate the remaining useful life of the device (column 2, lines 32-39).

It would have been obvious to one having ordinary skill in the art to modify the invention of Morris to include determining the remaining useful life, as taught by Runner, because Runner suggests that the combination would have provided means for indicating the amount of time before the device fails completely thereby preventing costly damage as well as giving the operator ample time to replace the device as needed before failure occurs (column 3, lines 31-42).

14. Claims 10, 20, 27, 30, 33, 34, and 36, as may best be understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Morris, Jr. et al. in view of Runner and further in view of U.S. Patent No. 6,265,880 to Born et al.

As noted above, the invention of Morris and Runner teaches many of the features of the claimed invention and while the combination does teach positioning sensitized media that detects chafing/abrasion, cutting or fraying damage, the combination does not specifically include a liquid filled pressure sensitized media strip, light conducting media strip, or waveguide for determining the location of the damage.

Born teaches an apparatus and method for detecting conduit chafing by wrapping a conduit with a sensing medium that is conductive, acts as a waveguide,

an optical cable, or fluid filled tube under pressure (abstract). Born teaches using a light generator, light conducting medium, and light detector for measuring changes in signals and secondary effects to determine the damage (column 3, lines 35-43) as well as using time-domain reflectometry to determine the location of the damage (column 60-63). Born also teaches that the conduit is either made up of insulated or non-insulated strands (column 1, lines 29-33 and column 3, lines 4-9).

It would have been obvious to one having ordinary skill in the art to modify the invention of Morris and Runner to include a liquid filled pressure sensitized media strip, light conducting media strip, or waveguide for determining the location of the damage, as taught by Born, because Born suggests a plurality of functionally equivalent means for determining the abrasion, cutting, or fraying of Morris and Runner and the combination would have provided means that do not require constant monitoring or electrical grounding (column 1, lines 44-47) thereby reducing the burden of the user while providing application in a wider variety of environments.

15. Claims 3 and 16, as may best be understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Morris, Jr. et al. in view of Runner and Born and further in view of U.S. Patent No. 5,574,213 to Shanley.

As noted above, Morris in combination with Runner and Born teaches many of the features of the invention and while the combination does teach including a

pressurized fluid acting as a sensitized medium, the combination does not specify that the medium include a fluorescent dye.

Shanley teaches an apparatus and method for detecting leaks including filling a vessel with fluorescent dye (abstract) and detecting the dye to determine the location of a leak (column 3, lines 31-45).

It would have been obvious to one having ordinary skill in the art to modify the invention of Morris, Runner, and Born to include specifying that the medium include a fluorescent dye, as taught by Shanley, because the combination of Morris, Runner, and Born does generally disclose determining the occurrence of a leak (Born, column 4, lines 5-9) and Shanley suggests that the combination would have provided an additional means for determining the location of the leak, thereby aiding the user in damage detection (column 3, lines 31-45).

16. Claims 5 and 12, as may best be understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Morris, Jr. et al. in view of Runner and further in view of U.S. Patent No. 4,988,949 to Boenning et al.

As noted above, the invention of Morris and Runner teaches many of the features of the claimed invention and while the combination does teach positioning sensitized media that detects chafing/abrasion, cutting or fraying damage, the combination does not specifically include sensing vibration with the medium including a piezoelectric sensitized medium.

Boenning teaches an apparatus for detecting excessive chafing of a cable arrangement against an electrically grounded structure including a semiconductor sensitized media (column 2, lines 47-50) that is piezoelectrically sensitized (column 8, lines 50-55) (i.e. PVC) and used in sensing vibration causing chafing (column 7, lines 13-29).

It would have been obvious to one having ordinary skill in the art to modify the invention of Morris and Runner to include sensing vibration with the medium including a piezoelectric sensitized medium, as taught by Boenning, because Boenning suggest that the combination would have provide means for employing the invention in a plurality of environments (column 1, lines 43-53) by taking into account the chafing that occurs because of vibration of or within the electrical system (column 1, lines 21-29).

17. Claims 6 and 28, as may best be understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Morris, Jr. et al. in view of Runner and further in view of U.S. Patent No. 6,275,050 to Born et al.

As noted above, the invention of Morris and Runner teaches many of the features of the claimed invention and while the combination does teach positioning sensitized media that detects chafing/abrasion, cutting or fraying damage, the combination does not specifically include sensing electromagnetic interference through the conduction of electromagnetic waves.

Born teaches an apparatus and method to detect corrosion in metal junctions including an electromagnetic interference sensor to detect conducted electromagnetic waves (column 5, lines 55-58).

It would have been obvious to one having ordinary skill in the art to modify the invention of Morris and Runner to include sensing electromagnetic interference through the conduction of electromagnetic waves, as taught by Born, because Morris and Runner teach determining corrosion and Born suggests a corresponding method for detecting the occurrence of corrosion since it is well known that corrosion disrupts the electrical signal that propagates through a metallic conductor (column 1, lines 16-21).

18. Claims 29, as may best be understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Morris, Jr. et al. in view of Runner and U.S. Patent No. 6,265,880 to Born et al. and further in view of U.S. Patent No. 5,271,274 to Khuri-Yakub et al.

As noted above, Morris in combination with Runner and Born teaches many of the features of the claimed invention and while the combination does teach positioning sensitized media that detects chafing/abrasion, cutting or fraying damage and performing TDR to determine the location of damage, the combination does not specify that the sensitized media conducts acoustic waves.

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Khuri-Yakub teaches thin film process monitoring techniques using acoustic waves wherein the acoustic waves are conducted on a line to perform TDR (column 3, lines 28-39).

It would have been obvious to one having ordinary skill in the art to modify the invention of Morris, Runner, and Born to include sensitized media that conducts acoustic waves, as taught by Khuri-Yakub, because the invention of Morris, Runner, and Born includes performing TDR to determine the location of damage and Khuri-Yakub suggests a corresponding method for performing the TDR in order to accurately determine damage location (column 3, lines 28-39).

19. Claims 15, 39, and 40, as may best be understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Morris, Jr. et al. in view of Runner and U.S. Patent No. 6,265,880 to Born et al. and further in view of U.S. Patent No. 5,712,934 to Johnson.

As noted above, Morris in combination with Runner and Born teaches many of the features of the claimed invention including sensitized media in the form of a fiber optic, but does not specify that the media includes silica, plastic, or glass.

Johnson teaches a fiber optical infrared sensor wherein the fiber optical cable has the well-known composition of silica, plastic or glass (column 1, lines 9-11).

It would have been obvious to one having ordinary skill in the art to modify the invention of Morris, Runner and Born to include specifying that the media includes silica, plastic, or glass, as taught by Johnson, because Johnson teaches the well-

known constructions of fiber optics necessary to carry out the invention of Morris, Runner and Born (column 1, lines 9-11).

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

U.S. Patent No. 5,862,030 to Watkins, Jr. et al. teaches an electrical safety device with conductive polymer sensor.

U.S. Patent No. 6,392,551 to De Angelis teaches a synthetic fiber cable with temperature sensor.

U.S. Patent No. 6,286,557 to May teaches a sheath including a sensitized media strip.

U.S. Patent No. 5,177,468 to Baldwin et al. teaches a conduit liner monitor.

U.S. Patent No. 4,840,480 to Starke et al. teaches a light conduit arrangement for monitoring a physical condition of a structural part.

Electroactive Polymers 1: Piezoelectric Materials, teaches the common types of piezoelectric materials.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey R. West whose telephone number is (571)272-2226. The examiner can normally be reached on Monday through Friday, 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (571)272-2216. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

jrw
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